

ABSTRACT

A method for forming a thin complete high-k layer for semiconductor applications. The method includes providing a substrate in a process chamber, depositing a thick complete high-k layer on the substrate, and thinning the deposited high-k layer to form a thin complete high-k layer on the substrate. Alternately, the substrate can contain an interface layer between the substrate and the high-k layer. The thinning can be performed by exposing the thick high-k layer to a reactive plasma etch process or, alternately, a plasma process capable of modifying a portion of the thick high-k layer and subsequently removing the modified portion of the thick high-k layer using wet processing.